

CLAIMS:

1. An additive for use in bottlewashing compositions, said additive effective for removal of mold and for protecting polyethylene terephthalate containers, said additive comprising at least one member selected from the group consisting of a C₆ alkyl diphenylene oxide disulfonates, ethoxylated alcohol sulfonates, alkyl polyether phosphate esters, aryl polyether phosphate esters, alkylaryl polyether phosphate esters, polycarboxylated ethylene oxide condensates of fatty alcohols, alkamides, and mixtures thereof, wherein said cleaning composition is compatible with polyethylene terephthalate.
2. The additive of claim 1 wherein said alkamide is coconut diethanolamide.
3. The additive of claim 1 further comprising at least a first phosphonate sequestrant.
4. The additive of claim 3 further comprising at least one second sequestrant which is a phosphate sequestrant, a phosphonate sequestrant or mixture thereof.
- 20 5. The additive of claim 1 wherein said surfactant is present at a concentration of about 1 wt-% to about 20 wt-%.
6. The additive of claim 1 wherein said surfactant is present at a concentration of about 2 wt-% to about 10 wt-%.
- 25 7. The additive of claim 1 wherein said surfactant is present at a concentration of about 5 wt-%.
8. The additive of claim 1 further comprising a defoamer.
- 30 9. The additive of claim 8 wherein said defoamer is a block copolymer of polyoxyethylene/polyoxypropylene.
10. The additive of claim 1 further comprising sodium gluconate.

11. The additive of claim 1 employed in an alkaline cleaning composition, said additive employed at a concentration of about 0.1 wt-% to about 10 wt-%.

5 12. The additive of claim 1 wherein said additive is employed at a concentration of about 0.2 wt-% to about 2 wt-%.

10 13. An alkaline bottlewashing composition effective for mold removal and for protecting polyethylene terephthalate containers, the composition comprising at least one C₄ to a C₂₀ alkyl diphenylene oxide disulfonate, at least one first phosphonate sequestrant and at least one second sequestrant which is a phosphate, a phosphonate, or mixture thereof.

15 14. The composition of claim 13 wherein said alkyl diphenylene oxide disulfonate is a C₆ to C₁₆ alkyl diphenylene oxide disulfonate.

15 15. The composition of claim 13 wherein said alkyl diphenylene oxide disulfonate is a C₆ alkyl diphenylene oxide disulfonate.

20 16. A composition for the protection of polyethylene terephthalate containers, said composition comprising at least one member selected from the group consisting of ether carboxylates, at least one alkamide, polycarboxylated ethylene oxide condensates of a fatty alcohols, ethoxylated alcohol sulfonates, at least one alkyl polyether phosphate ester, at least one aryl polyether phosphate ester, at least one alkylaryl polyether phosphate ester, and mixtures thereof.

25 17. The composition of claim 16 wherein said alkamide is coconut dithanolamide.

18. The composition of claim 16 further comprising at least one phosphonate sequestrant.

30 19. The composition of claim 16 further comprising at least one second sequestrant which is a phosphonate sequestrant, a phosphate sequestrant, or a mixture thereof.

20. The composition of claim 16 wherein said first phosphonate sequestrant is present in an amount of about 0.1 to 15 wt-% of the composition and said second sequestrant is present in an amount of about 5 to 40 wt-% of the composition.

5 21. The composition of claim 16 further comprising a gluconate sequestrant.

22. The composition of claim 16 further comprising at least one defoamer.

10 23. The composition of claim 22 wherein said defoamer is a block copolymer of polyoxyethylene/polyoxypropylene.

15 24. A method for removal of mold from and protection of polyethylene terephthalate containers, the method comprising the step of contacting said polyethylene terephthalate container with an alkaline wash composition comprising at least cleaning/protecting surfactant selected from the group consisting of C₄ to C₂₀ alkyl diphenylene oxide disulfonates, ethoxylated alcohol sulfonates, alkyl polyether phosphate esters, aryl polyether phosphate esters, alkylaryl polyether phosphate esters, polycarboxylated ethylene oxide condensates of fatty alcohols and mixtures thereof.

20 25. The method of claim 24 wherein said alkyl diphenylene oxide disulfonate is a C₆ to C₁₆ alkyl diphenylene oxide disulfonate.

26. The method of claim 24 wherein said alkyl diphenylene oxide disulfonate is a C₆ alkyl diphenylene oxide disulfonate.

25 27. The method of claim 24 wherein said surfactant is present at a concentration of about 1 wt-% to about 20 wt-%.

28. The method of claim 24 wherein said surfactant is present at a concentration of 30 about 2 wt-% to about 10 wt-%.

29. The method of claim 24 wherein said surfactant is present at a concentration of about 5 wt-%.

30. The method of claim 24 wherein said wash composition further comprising a defoamer.

31. The method of claim 30 wherein said defoamer is a block copolymer of 5 polyoxyethylene/polyoxypropylene.

32. The method of claim 24 wherein said wash composition further comprising at least one first sequestrant which is a phosphonate sequestrant.

10 33. The method of claim 32 wherein said wash composition further comprising a second sequestrant which is a phosphate sequestrant, a phosphonate sequestrant or a mixture thereof.

15 34. The method of claim 24 wherein said wash composition further comprises at least one gluconic acid sequestrant or salt thereof.

35. A method for protecting polyethylene terephthalate containers, said method including the step of contacting said containers with a composition comprising at least one member selected from the group consisting of ether carboxylates, alkamides, 20 polycarboxylated ethylene oxide condensates of a fatty alcohols, alkylpolyether sulfonates, and mixtures thereof.

36. The method of claim 35 wherein said composition further comprising at least one first phosphonate sequestrant.

25 37. The method of claim 36 wherein said composition further comprising at least one second sequestrant which is a phosphate sequestrant, a phosphonate sequestrant or a mixture thereof.

30 38. The method of claim 37 wherein said first phosphonate sequestrant is present in an amount of about 0.1 to 15 wt-% of the composition and said second sequestrant is present in an amount of about 5 to 40 wt-% of the composition.

39. The method of claim 35 wherein said composition further comprising at least one gluconic acid sequestrant or salt thereof.

40. The method of claim 35 wherein said composition further comprising a
5 defoamer.

41. The method of claim 40 wherein said defoamer is a block copolymer of polyoxyethylene/polyoxypropylene.

10 42. A method for washing single use recyclable polyethylene terephthalate articles comprising the steps of:

- a) cutting said polyethylene terephthalate articles into pieces;
- b) washing said pieces of said polyethylene terephthalate articles with a cleaning composition comprising at least one member selected from the group consisting of a C₄ to C₂₀ alkyl diphenylene oxide disulfonates, ethoxylated alcohol sulfonates, alkyl polyether phosphate esters, aryl polyether phosphate esters, alkylaryl polyether phosphate esters, polycarboxylated ethylene oxide condensates of fatty alcohols, alkamides, and mixtures thereof; and
- c) melting said pieces of polyethylene terephthalate.